

CLAIMS

What Is Claimed Is:

1. A battery cell attachment method wherein:
5 when a battery cell, wherein positive polarity material and negative polarity material are placed in opposition through a separator in a battery case, and a liquid electrolyte is packed into said battery case, is attached in an apparatus installed in a place acted on by centrifugal force, said battery cell is attached in said apparatus so that one side where the negative polarity material is present faces in a direction in
10 which said centrifugal force is acting on said apparatus.
2. The battery cell attachment method according to claim 1, wherein, when said battery cell of which battery case is a flat shape is divided in two in the thickness direction thereof, and vacant volume remaining after volumes of negative polarity material, positive polarity material, and separator are subtracted from volume
15 inside said battery case in each divided part, said battery cell is attached such that said vacant volume is smaller in said divided part on side where negative polarity material is placed than in said other divided part.
3. The battery cell used in the attachment method according to claim 1, configured by placing a positive polarity material of which main component is either a
20 metal oxide, halide, or sulfide, and a negative polarity material of which main component is either light metal or light metal alloy, so that they oppose each other through a separator made of a substance capable of withstanding temperatures in excess of 150°C, into a battery case; packing a liquid electrolyte consisting of an organic solvent or mixture of organic solvents having a solvent boiling point of 170°C
25 or higher into which a lithium salt is dissolved as a solute between the positive polarity material and the negative polarity material; and sealing the opening in said battery case with a sealing plate, with an intervening gasket that is resistant to temperatures in excess of 150°C and resistant also to organic solvents.
4. The battery cell of claim 3, wherein said separator is made of a
30 substance selected from among glass fiber, polyphenylene sulfide fiber, vinylidene polyfluoride resin, polytetrafluoroethylene resin, polybutylene terephthalate resin, and ceramic resin.

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5. The battery cell of claim 3, wherein said organic solvent is made of a substance selected from among gamma butyrolactone, ethylene carbonate, butylene carbonate, propylene carbonate, sulfolane, and 3-methyl sulfolane.

6. The battery cell of claim 3, wherein said gasket is made of a substance selected from among polyphenylene sulfide resin, polyether ketone resin, polyether ether ketone resin, polytetrafluoroethylene resin, and vinylidene tetrafluoride resin.

7. A battery cell attachment method wherein:
when a battery cell wherein a positive polarity material and a negative polarity material are placed in opposition in a battery case with an intervening separator, and wherein a liquid electrolyte is packed inside said battery case, is attached in an apparatus installed in a place acted on by centrifugal force, said battery cell is mounted in said apparatus so that negative polarity material side of said battery cell faces in direction in which said centrifugal force acts on said apparatus, and angle of inclination of thickness direction of said battery cell is within a range of 0 to 60 degrees relative to direction of said centrifugal force.

8. The battery cell attachment method according to claim 7, wherein, when said battery cell of which said battery case is a flat shape is divided in two in thickness direction thereof, and vacant volume remaining after volumes of negative polarity material, positive polarity material, and separator are subtracted from volume inside said battery case in each divided part is calculated, said battery cell is attached such that said vacant volume is smaller in said divided part on side where negative polarity material is placed than in said other divided part.

9. The battery cell used in the attachment method according to claim 7, configured by placing a positive polarity material of which main component is either a metal oxide, halide, or sulfide, and a negative polarity material of which main component is either light metal or light metal alloy, so that they oppose each other through a separator made of a substance capable of withstanding temperatures in excess of 150°C, into a battery case; packing a liquid electrolyte consisting of an organic solvent or mixture of organic solvents having a solvent boiling point of 170°C or higher into which a lithium salt is dissolved as a solute between the positive polarity material and the negative polarity material; and sealing the opening in said battery case with a sealing plate, with an intervening gasket that is resistant to temperatures in excess of 150°C and resistant also to organic solvents.

10. The battery cell of claim 9, wherein said separator is made of a substance selected from among glass fiber, polyphenylene sulfide fiber, vinylidene polyfluoride resin, polytetrafluoroethylene resin, polybutylene terephthalate resin, and ceramic resin.

11. The battery cell of claim 9, wherein said organic solvent is made of a substance selected from among gamma butyrolactone, ethylene carbonate, butylene carbonate, propylene carbonate, sulfolane, and 3-methyl sulfolane.

12. The battery cell of claim 9, wherein said gasket is made of a substance selected from among polyphenylene sulfide resin, polyether ketone resin, polyether ether ketone resin, polytetrafluoroethylene resin, and vinylidene tetrafluoride resin.

13. A battery cell attachment device wherein:
when a battery cell wherein a positive polarity material and a negative polarity material are placed in opposition in a battery case with an intervening separator, and wherein a liquid electrolyte is packed inside said battery case, is attached in an apparatus installed in a place acted on by centrifugal force, said battery cell is mounted in a prescribed position in said apparatus, using attachment means for making negative polarity material side of said battery cell face in direction in which said centrifugal force acts on said apparatus, and regulating battery cell installation direction so that angle of inclination of thickness direction of said battery cell relative to said direction of centrifugal force is within a prescribed range.

14. The battery cell attachment device of claim 13, wherein the attachment means has an attachment structure configured such that only one of the positive polarity side and negative polarity side of the battery cell having mutually different outer shapes fits in this attachment means, whereby said battery cell can be loaded in such manner that battery cell installation direction is regulated.